

MISSOURI CONSERVATIONIST



VOLUME 84, ISSUE 5, MAY 2023
SERVING NATURE & YOU

NATURE

is

healthy



Exposure to nature can **help you relax** and be kind to others.



Spending time in conservation areas, woods, backyards, and urban parks may **ease stress levels**.



Getting away from busy schedules allows people to **connect with nature and themselves** in a way that brings calm and a sense of well-being.



Being outdoors gives us energy, **makes us happier**, and helps us feel more focused.



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Get outside and enjoy nature today!
Download the free **MO Outdoors** app
for ideas on where to go near you.



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Gray treefrog

MISSOURI
CONSERVATIONIST



ON THE COVER

A small stream of waterfall flows into Shelton Creek.

© NOPPADOL PAOTHONG

15mm lens, f/11
1/12 sec, ISO 100

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Inbox



Letters to the Editor

Submissions reflect readers' opinions and may be edited for length and clarity. Email Magazine@mdc.mo.gov or write to us:

MISSOURI
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PHOTO MAGIC

The photographs in the April edition are remarkable. The wild turkey on the cover is striking, as are the monarch butterfly eggs on the back cover. Noppadol Paothong and David Stonner are fascinating photographers.

Don Landon
Springfield

FLYING HIGH

Thank you for publishing the information on the Loess Bluffs Wildlife Refuge [*Flying High*, February, Page 10]. My husband and I took a late February trip to the refuge and it was an experience we will never forget. Witnessing the snow geese migration was a true blessing. The unspoiled scenic beauty of this place is unforgettable.

Since we are from Arnold, we spent a couple of nights at a local bed and breakfast. Due to your article, we were able to enjoy an unforgettable winter getaway. With heartfelt gratitude, thank you for your wonderful magazine. I look forward to every issue.

Connie Gurley Arnold

SPRING BEAUTIES

The *Missouri Conservationist* features some of the finest nature photography I've ever enjoyed. I have to send my thanks to Noppadol Paothong for the predictably breathtaking photos that bear his signature. I cannot imagine the patience it must require to capture the perfect light on the flowers featured on the cover [Spring beauty, March] and the bunnies [Resuming Her Loveliness, March, Pages 22-23].

Rich Leppert Kansas City

PADDLEFISH

We got a kick out of the paddlefish photo in the March In Brief [Page 5]. Looks like that paddlefish had swallowed a fisherman. We always enjoy your magazine. Thanks for the chuckle.

Angelo Mancini Independence

TRAIL RUNNING

Regarding *Nature at a Different Pace* [April, Page 21], the first thing that should have been said was to avoid the areas during deer and turkey seasons. I also hunt squirrel and grouse on conservation areas outside the aforementioned seasons.

Zac Cannon via email

Editors' note: Trail running is another way to enjoy our conservation areas. It effortlessly combines your workout routine with the health and benefits of being in nature. However, before lacing up your running shoes and heading to a conservation area, always check the area for other activities, especially hunting seasons. Areas should always be avoided during active hunting seasons. You can use our online Places to Go tool at mdc.mo.gov/places-go for this information.

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Have a Question for a Commissioner?

Send a note using our online contact form at mdc.mo.gov/commissioners.

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The Missouri Department of Conservation protects and manages the fish, forest, and wildlife of the state. We facilitate and provide opportunity for all citizens to use, enjoy, and learn about these resources.



**Want to see your photos
in the Missouri Conservationist?**

Share your photos on Flickr at flickr.com/groups/mdcreaderphotos-2023 or email Readerphoto@mdc.mo.gov.

**1**

1 | Eastern tiger swallowtail by [John Mantre](#), via Flickr

2 | Eastern red bat by [Denver Snider](#), via email

3 | Round-leaved groundsel by [Mary Grinter](#), via Flickr

**2****3**

**Want another chance to see
your photos in the magazine?**

→ In the December issue, we plan to feature even more great reader photos. Use the submission methods above to send us your best year-round pictures of native Missouri wildlife, flora, natural scenery, and friends and family engaged in outdoor activities. Please include where the photo was taken and what it depicts.

TAYLOR LYNN PHOTOGRAPHY



Up Front

with Sara Parker Pauley

✖ When I crest the final hill on our road at day's end, it's the sycamores I first see — their white trunks and branches towering over the little creek and field that create the natural boundary of our property. With that view, I know I am home. "Place has always been the thing that made us. We cannot escape being formed by it," says author Cole Arthur Riley.

In this month's issue, you'll read about Missouri's distinct and diverse natural communities — the places where specific Missouri flora and fauna thrive. From wetlands and woodlands to prairies and caves, they are the discrete physical environments that certain plants and animals call home. And just like any home, they require ample maintenance and care. (Learn about MDC's efforts on Page 11.)

This was highlighted for me on a recent tour of MDC's Hi Lonesome Prairie Conservation Area in southwest Missouri, near Cole Camp. The MDC team responsible for the 655-acre remnant prairie had just finished sharing their story of the decades-long effort to maintain this treasured natural community through prescribed burning, grazing, and other management tools. As if on cue, a large covey of quail walked across the road, just yards from our vehicle. I thought of Aldo Leopold's words: "To those devoid of imagination, a blank place on the map is a useless waste; to others, the most valuable part." To a passerby, it may have seemed like just another field of grass — to the covey of quail, this beautiful prairie was home.

Sara Parker Pauley

SARA PARKER PAULEY, DIRECTOR

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Nature LAB

by Dianne Van Dien

Each month, we highlight research MDC uses to improve fish, forest, and wildlife management.

RESOURCE MANAGEMENT

Grassland Bird Surveys

Grassland-dependent species in North America are drastically declining, mainly due to habitat loss. Since most of Missouri's historical grasslands and prairies are now used for agriculture, MDC strives to preserve and restore the grasslands in its care and assists private landowners who want to do the same on their lands. To help measure grassland health, MDC began working with the Missouri River Bird Observatory (MRBO) in 2013 to survey grassland birds on MDC lands and on partnering private lands.

"We're keeping our fingers on the pulse of the grasslands with these monitoring projects," says MRBO co-Director Dana Ripper. "Birds are dependent on healthy landscapes and insect abundance and can be seen as an indicator species and as an umbrella species. That makes our survey information applicable for adaptive grassland management."

When conducting surveys, MRBO staff walk transect lines across the properties while watching and listening for birds. They record their sightings directly into mobile devices.

"We want to map exactly where the birds are," explains MRBO co-Director Ethan Duke. "Through



Eastern meadowlark

Birds that depend on grasslands are among the most threatened groups of birds in the world. Maintaining, improving, and restoring grasslands is critical for the long-term survival of Missouri's grassland species.

Routine monitoring of grassland bird populations provides feedback for grassland management

the ESRI Field Maps app, our data is placed onto maps. This gives us a highly efficient mode of data collection that is highly accurate for estimating distances."

This method, called line-transect distance sampling, is coupled with statistical software to estimate the number of birds per 100 acres.

To help evaluate habitat quality, MRBO also developed something they call "bird-friendliness scores." The scores are calculated from the analyzed survey data for species' abundance, diversity, and density along with level of conservation concern.

"The scores serve as a big umbrella perspective for land managers to understand how a particular property is contributing to the grassland bird population," Ripper says.

Grassland Bird Surveys at a Glance

The Missouri River Bird Observatory partners with MDC to survey grassland birds on MDC lands and those of interested private landowners. Information about bird populations helps managers adjust their management practices to meet their conservation goals.

Focal grassland bird species in Missouri include:

1. Eastern meadowlark
2. Northern bobwhite
3. Grasshopper sparrow
4. Henslow's sparrow
5. Dickcissel
6. Bobolink
7. Upland sandpiper
8. Loggerhead shrike



In Brief

News and updates from MDC



APPLY FOR ELK AND BEAR HUNTING

ONLINE PERMIT APPLICATIONS OPEN MAY 1, DRAWINGS OCCUR JULY 1

→ MDC is offering 400 permits for the harvest of a maximum of 40 black bears during the 2023 Missouri black bear hunting season this fall, Oct. 16-25.

MDC also is offering five permits to hunt bull elk in Missouri this fall — one permit designated for a qualifying landowner that owns property in Carter, Reynolds, or Shannon counties and the remaining permits for the general public. The elk archery portion will run Oct. 21-29, and the elk firearms portion will run Dec. 9-17. The five permits, valid for both portions, will be for bull elk with at least one antler 6 inches or greater in length.

Only Missouri residents at least 11 years of age by the first day of the hunt for which they are applying are eligible to apply for bear and elk permits during the application period of May 1-31. All permits will be assigned through a random drawing.

For more information on elk and elk hunting in Missouri, visit mdc.mo.gov/elkhunting.

Learn more about black bears and bear hunting in Missouri at mdc.mo.gov/bearhunting.

Chase Boggs of Bolivar harvested the female bear above with his bow on private land in Douglas County during the 2022 season. MDC will offer 400 permits to harvest 40 bears during the 2023 season. Shown with Boggs is Douglas County Conservation Agent Mark Henry.

Apply for bear and elk hunting permits May 1-31 online at mdc.mo.gov/buypermits, through MDC's free MO Hunting app, through a permit vendor, or by calling 800-392-4115. Results of the bear and elk permits random drawings will be available online by July 1.



In Brief



GET HOOKED ON FISHING

Want some free fun that gets family and friends outside in nature? Get hooked on fishing with MDC's Free Fishing Days June 10 and 11. During Free Fishing Days, which are the Saturday and Sunday following the first Monday in June each year, anyone can fish in the Show-Me State without a fishing permit, trout permit, or trout park daily tag.

Other fishing regulations remain in effect during this time, such as limits on size and number of fish an angler may keep. Special permits may still be required at some county, city, or private fishing areas. Trespass laws remain in effect on private property.

Conservation makes Missouri a great place to fish, and Free Fishing Days encourages people to sample our state's abundant fishing opportunities. Missouri has more than a million acres of surface water, and most of it provides great fishing. More than 200 different fish species are found in Missouri, with more than 20 of them being game fish for the state's more than 1.1 million anglers.

For more information on Missouri fishing regulations, fish identification, and more, get a copy of the 2023 *Summary of Missouri Fishing Regulations*, available at conservation offices and where permits are sold or online at short.mdc.mo.gov/4gy.



Ask MDC

Got a Question for Ask MDC?

Send it to AskMDC@mdc.mo.gov or call 573-522-4115, ext. 3848.

Q: I found this little guy while mushroom hunting. What type of moth is this?

► Based on the size and color, this moth is likely to be an imperial moth (*Eacles imperialis*). At this stage in its life, the moth is waiting for its wings to dry and unfold. It still has its hemolymph — a fluid equivalent to blood in invertebrates — in its abdomen, but the fluid slowly will be pumped into its wings. When complete, its wingspan will be 3½ to 5½ inches.

Found through the eastern United States, imperial moths emerge before sunrise and mate after midnight the next day. Females lay eggs at dusk singly or in small groups of two to five on the leaves of trees. The eggs hatch in about two weeks. These caterpillars are solitary feeders, often eating the leaves of maples, sycamores, and sassafras.

But as members of the giant silk moth family, the mouthparts of the adult moths are not functional, and they do not live long in the winged form.



Imperial moth

Q. I had an American crow in one of my trees, and it was mimicking a turkey hen's yelp. Is this common among crows?

► Known for being both highly intelligent and very social, American crows can make up to 250 different types of vocalizations — caws being among the most common. But they are excellent mimics and can replicate a host of different sounds, including the calls of other birds and human speech. They also produce vocalizations that sound like cats, dogs, and geese.

Q. I was crossing a creek during turkey season when I saw something upstream bobbing towards me. It was a three-toed box turtle. It had its head and legs out, just floating along. Do turtles swim?

► Although three-toed box turtles are considered a



Three-toed box turtle

mdc.mo.gov/mootdoors

The Ozark National Scenic Riverway, including the Current and Jaks Fork Rivers, will soon see an increase in floating activity. Before you join them, be prepared for a day in the sun by packing plenty of water and sun protection. Treat your vessel like a boat and have a personal flotation device for each passenger. Make sure children always wear life jackets. Let someone know your float plan and what time you plan to leave and return. Know where you are going, if it is a public or private, and the rules that govern the area. A good place to start is the MO Outdoors app, available for download in Android or iPhone platforms at www.moutdoors.org.

AGENT ADVICE

Logan Brawley
SHANNON COUNTY
CONSERVATION AGENT
offers this month's



<p>exposed perches in tall trees that offer an unobstructed view of insects passing by and clear air space for catching them. They're usually seen in forests, woodlands, and wooded parks. This is an edge-dwelling species — they prefer places where wooded areas adjoin grassy places. Therefore, anything that creates openings in the woods increases habitat for this species. For more information, visit short.mdc.mo.gov/4QU.</p>	<p>insectivores forage from high, insect-rich shrubs (crinities). These are known to float across a waterbody's surface. For more information about three-toed box turtles, visit short.mdc.mo.gov/4QJ.</p>
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A close-up photograph of a Great Crested Flycatcher hanging upside down from a dark, curved branch. The bird's bright yellow belly and orange-yellow rump are clearly visible. Its dark, striped wings and a distinctive blue-grey crest are also prominent. The background is a soft-focus green, suggesting a natural, outdoor setting.

SPECIES OF *Conservation Concern*



STATE ENDANGERED

Western Chicken Turtles

by Jeffrey T. Briggler

The western chicken turtle is a state endangered species that is being considered for federal listing. Western chicken turtles range from southeastern Missouri, south to Louisiana, and west to eastern Texas and Oklahoma. This semi-aquatic turtle spends most of its life wandering and overwintering on the hardwood forest floor. In the spring, they are found in shallow, still to slow-moving wetlands, such as river sloughs, oxbow lakes, temporary wetlands, and swamps. Historically, they were found in numerous southeastern Missouri counties but now only occur at two sites. This is the rarest species of turtles in Missouri.

WHY IT'S IMPERILED

Western chicken turtles have declined mainly due to the elimination of their habitat, especially the draining of wetlands needed for foraging and mating in the spring and bottomland forest needed during summer movement and overwintering.

MDC RESTORATION EFFORTS

Ongoing efforts to restore populations of this rare turtle include protection and management of the few remaining high-quality bottomland forests and associated wetlands. Continued survey efforts, such as trapping of wetlands and collection of water to detect their presence via DNA, are required to better understand their status and distribution. Also, propagation efforts to collect eggs for captive-rearing and future releases is progressing.

WHAT CAN YOU DO?

Protecting the remaining wetlands and bottomland forests, as well as constructing wetlands and planting trees, will help to ensure this turtle remains part of Missouri's biodiversity. This species is rarely seen, so if you do encounter one, please snap a photograph and send it to Jeff.Briggler@mdc.mo.gov.



BE BEAR AWARE

Black bears are an exciting part of Missouri's natural history, and they're making a comeback in the southern part of the state. MDC encourages you to Be Bear Aware to stay safe in bear country and keep our bears wild.

Never feed a bear! Feeding bears makes them lose their natural fear of humans and teaches them to see humans as food providers. They will learn to go to places such as homes, campsites, and neighborhoods to look for food, instead of staying in the forest. A bear that has gotten used to getting food from humans may become aggressive and dangerous. When this happens, the bear has to be destroyed. Learn how to Be Bear Aware at short.mdc.mo.gov/4gt.

THANK YOU FOR SHARING THE HARVEST

MDC and the Conservation Federation of Missouri (CFM) thank the thousands of Missouri deer hunters who donated 235,169 pounds of venison to the state's Share the Harvest program this past deer season, including 4,936 whole deer. MDC and CFM also thank the participating meat processors throughout the state who grind the donated deer meat into ready-to-use packages, and the many sponsors who financially support the program.

The donated deer meat goes to local food banks and food pantries to help feed hungry Missourians all around the state. Meat-processing fees are covered entirely or in part by numerous local sponsors, along with statewide sponsors that include Shelter Insurance, Bass Pro Shops, Feeding Missouri, and MDC.

Share the Harvest is coordinated by MDC and CFM and has been helping feed hungry Missourians for more than 30 years. Since the program was started in 1992, it has provided nearly 5 million pounds of lean, healthy venison to help feed hungry Missourians. To get Share the Harvest venison, contact local food banks or food pantries.

For more information on Share the Harvest, visit CFM at short.mdc.mo.gov/4Mk.



The donated deer meat is ground and packaged and goes to local food banks and food pantries to help feed hungry Missourians all around the state.

WHAT IS IT? BALD CYPRESS SEED CONE



Bald cypress trees occur in swamps, sloughs, and wet bottomland forests. A large tree, bald cypress can grow up to 130 feet tall. Its fruit, which ripen from October through November, are 1-inch round cones. The cones, green changing to purple, are tightly closed with shield-shaped scales that open at maturity to release seeds.



In Brief

MIGRATORY GAME BIRD AND WATERFOWL SEASONS

The Missouri Conservation Commission approved recommendations at its March meeting for the upcoming 2023 migratory game bird hunting seasons and 2023–2024 waterfowl-hunting seasons.

2023 Migratory Game Bird Hunting

Mourning Doves, Eurasian Collared Doves, and White-Winged Doves

Season: Sept. 1–Nov. 29

Limits: 15 daily and 45 in possession combined total for all three species

Hours: One-half hour before sunrise to sunset

Sora and Virginia Rails

Season: Sept. 1–Nov. 9

Limits: 25 daily and 75 in possession combined for both species

Hours: One-half hour before sunrise to sunset

Wilson's (Common) Snipe

Season: Sept. 1–Dec. 16

Limits: 8 daily and 24 in possession

Hours: One-half hour before sunrise to sunset

American Woodcock

Season: Oct. 15–Nov. 28

Limits: 3 daily and 9 in possession

Hours: One-half hour before sunrise to sunset

2023–2024 Waterfowl Hunting

Teal

Season: Sept. 9–24

Limits: 6 daily and 18 in possession

Hours: Sunrise to sunset

Ducks

Season:

- North Zone: Oct. 28–Dec. 26
- Middle Zone: Nov. 4–12 and Nov. 18–Jan. 7, 2024
- South Zone: Nov. 23–26 and Dec. 7–Jan. 31, 2024

Bag Limit: 6 ducks daily with species restrictions of:

- 4 mallards (no more than 2 females)
- 3 wood ducks
- 2 black ducks
- 2 canvasbacks
- 2 hooded mergansers
- 2 redheads
- 2 scaup for first 45 days and 1 scaup for last 15 days
- 1 mottled duck
- 1 pintail

Possession Limit: Three times the daily bag or 18 total, varies by species

Hours: One-half hour before sunrise to sunset

Coots

Season: Same as duck season dates in the respective zones

Limits: 15 daily and 45 in possession

Hours: One-half hour before sunrise to sunset

Canada Geese and Brant

Season: Oct. 7–15 and Nov. 11–Feb. 6, 2024

Limits: 3 Canada geese and brant in aggregate daily, 9 in possession

Hours: One-half hour before sunrise to sunset

Snow Geese (White and Blue Phases) and Ross's Geese

Season: Nov. 11–Feb. 6, 2024

Limits: 20 blue, snow, or Ross's geese daily with no possession limit

Hours: One-half hour before sunrise to sunset

White-Fronted Geese

Season: Nov. 11–Feb. 6, 2024

Limits: 2 daily and 6 in possession

Hours: One-half hour before sunrise to sunset



Light Goose Conservation Order

Season: Feb. 7, 2024–April 30, 2024

Limits: No daily or possession limits

Hours: One-half hour before sunrise to one-half hour after sunset

Methods: For the taking of blue, snow, and Ross's geese during the Conservation Order, hunters may use shotguns capable of holding more than three shells and recorded or electronically amplified bird calls or sounds or imitations of bird calls or sounds.

Youth Hunting Days

North Zone: Oct. 21–22

Middle Zone: Oct. 21–22

South Zone: Nov. 18–19

Limits: Limits for ducks, geese, and coots are the same as during regular seasons

Hours: Same as during regular waterfowl season

Requirements: Any person 15 years of age or younger may participate in youth waterfowl hunting days without permit provided they are in the immediate presence of an adult 18 years of age or older. If the youth hunter is not certified in hunter education, the adult must have the required permits and have in his or her possession proof of hunter education unless exempt. The adult may not hunt ducks but may participate in other seasons that are open on youth hunting days.



For more information on migratory bird and waterfowl hunting, visit MDC online at short.mdc.mo.gov/4gv, or get MDC's *Migratory Bird and Waterfowl Hunting Digest 2023–2024*, available beginning in July at conservation offices and where hunting permits are sold.

Mallard



Missouri's Incredible Natural Communities

CONSERVING IMPORTANT AREAS SO DIVERSE LIFE CAN FLOURISH

Missouri is home to all sorts of native plants and animals. For example, did you know that there are more species of native plants in Missouri than in all of Alaska? Or that we have three times the number of native reptile species than in Montana? And our thousands of miles of streams support the nation's ninth most diverse fish population.

As conservationists, we strive to keep populations of all these species healthy — keeping the common species common and recovering those that are rare and declining. The key to maintaining this great diversity is to protect, conserve, restore, and, in some cases, reconstruct the habitats that our native flora and fauna require.

Throughout the state we find that recurring patterns of local climate, soils, topography, and geology support similar groups of plant and animal species. We call these assemblages “natural communities,” and in Missouri, conservation professionals and private citizens work to manage native grasslands (prairies and savannas), glades, forests, woodlands, streams and springs, wetlands, and caves. These major types of natural communities can be further subdivided into more specific types, such as a mesic (moist but not wet) bottomland forest. Natural communities are the lands and waters that support habitat specialists such as darters, gentians, and warblers.

The way we Missourians can keep all the native flora and fauna we've inherited is to conserve the natural communities of our state for future generations to learn about and enjoy.

In this article, different subject experts describe these natural communities and examples of work that MDC, partners, and private landowners and citizen conservationists are doing to restore and manage these areas for a variety of benefits. There are multiple phases to this work, which, regardless of public or private ownership, require developing a solid plan. Early phases of implementing the plan require patience as the area may not look the way users expect. But rest assured the messy, rough look is an anticipated and important step toward a healthier and more functional natural community. As the famous conservationist Aldo Leopold wrote in *Round River*, “To keep every cog and wheel is the first precaution of intelligent tinkering.” And the way we Missourians can keep all the native flora and fauna we’ve inherited (otherwise known as Leopold’s “cogs and wheels”) is to conserve the natural communities of our state for future generations to learn about and enjoy.

Native Grasslands (Prairies/Savannas)

by Frank Loncarich and Tom Thompson

Native prairies and open savannas are grasslands with a high diversity of plants and few trees. Into the early 1800s, these native grasslands covered about 15 million acres in Missouri. Now, only an estimated 45,000 acres (less than one half of one percent) remain unconverted to other land uses, of which about half is formally protected and managed by conservation organizations, and the other half is owned and managed by private landowners. The acres that do remain are scattered, small, and disconnected, but incredibly important. Some of Missouri’s most imperiled plant and animal species make their home on native prairies and savannas, including grassland songbirds, which is one of North America’s fastest declining guilds of birds. Missouri native grasslands need all our help, and protecting the remaining prairies and savannas and restoring native grasslands to places



Short-eared owl



Above: Grassland reconstructions with a high diversity of native plants offer immense benefits, including supporting a variety of wildlife, rebuilding healthy soils, and improving water quality.

Right: Land managers use traditional farm equipment for the large-scale dormant season planting of native grasses and wildflowers.



they once occurred is a critical step in the process of preserving Missouri's rich biodiversity.

Prairies and savannas developed under an environment of frequent fire, and, in modern conservation, prescribed (controlled) fire is one of the best ways to maintain and enhance prairie biodiversity. MDC staff burn thousands of acres of prairie on conservation areas annually and provide technical assistance to private prairie landowners interested in burning. Prescribed fire also helps control invading tree species that don't belong on grasslands but have appeared after years with no fire.

Another key component in native grassland conservation is a management practice called prairie reconstruction. This practice involves identifying areas that were historically native prairie but converted to a different use and planting a highly diverse mix of native prairie plants on these sites. Once these plants are established, they are managed like a native prairie

with fire and sometimes light grazing. MDC staff at Shawnee Trail Conservation Area (CA) in Barton County have restored over 1,500 acres of diverse prairie reconstructions over the last decade. They have also removed invading, undesirable trees from draws and fence rows and started a prescribed burning and conservation grazing program.

"The prairie reconstruction projects have transformed this once highly agricultural area back into large grasslands that approximate the native prairie that once existed there, supporting habitat for prairie plants and a host of prairie pollinators and birds, especially wintering short-eared owls and northern harriers," said MDC Wildlife Management Biologist Warren Sharp, Shawnee Trail CA manager.

Remnant prairies and savannas, along with prairie reconstructions, also build soil, store carbon, prevent erosion, increase stormwater infiltration, and assist with regulating stream flow and water quality.



Glades

by Susan Farrington and Mike Leahy

Glades are dry and sunny openings in woodlands with shallow soil and bedrock very close to the surface. It takes tough plants and animals to live on a glade, and some wildlife usually associated with deserts are right at home, including tarantulas and scorpions. Glades feature a rich variety of native grasses and wildflowers, which in turn support an abundance of birds, butterflies, and other pollinators. Turkeys love to nest at the shrubby edge of a glade, feeding on grasshoppers in the open grass. Deer use glades for cover in the high grass, particularly to hide their fawns.

Historically, glades were kept open by fire caused both by lightning strikes during severe drought years and fires set by Native Americans and early settlers. Modern fire suppression allows aggressive native red cedar to colonize and shade out desirable wildflowers and grasses. A cedar thicket provides protection from the wind, but it provides very little wildlife food and diversity.

To restore a glade, MDC staff cut and remove cedar trees. If the cedars are large enough, the logs can be sold commercially. A prescribed fire following cedar removal rejuvenates the glade and wildflowers will often flourish within a few short years. Generally, no seeding is required — the seeds and native plants are still there waiting to see the sun. Before introducing fire, staff prefer to burn the cedar slash in piles in damp or snowy weather. This reduces the very volatile slash that otherwise would result in a fire hot enough to scorch soils and potentially kill the old oak trees that belong on a glade. Prescribed fire approximately every two to five years helps to maintain our amazing Missouri glades.

Top: Glade coneflowers put on a showy display on a well-managed glade.

Left: Removing eastern red cedar is a needed practice to restore the health and function of many of Missouri's glades.





Missouri's mature forests form a closed canopy of overlapping layers of overstory, midstory, and understory vegetation.

Forests

by Rich Blatz, Brad Graham, and Mike Leahy

Forests are one of Missouri's most important and valuable resources. More than 15 million acres of forest and woodlands cover Missouri's landscape. Missouri's forests play a critical role in protecting water quality, storing carbon, producing oxygen, maintaining soil productivity, supporting a vibrant forest products and tourism industry, and promoting biological diversity. An extensive list of plants and animal species depend on Missouri's forests as their primary habitat. These include, but are not limited to, endangered bats, neotropical migrant birds, unique amphibians, and, of course, deer and turkey.

A mature forest is dominated by trees forming a closed canopy of multiple overlapping layers called the overstory, midstory, and understory. The overstory is comprised of large trees that create the canopy. The midstory is often dominated by smaller trees and large shrubs. The understory is comprised of tree seedlings, grasses, wildflowers, and other low growing vegetation.

Forested landscapes should be constantly shifting, transitioning between seedling and sapling stages to mid-sized stages to mature trees. To maintain a healthy and sustainable forest landscape, 10 percent should be in regeneration (young seedlings), 30 percent in sapling sized trees, 35 percent in mid-sized trees, and 25 percent in large trees.

MDC has great examples of sustainable forest management throughout the state. In the northeastern part of the state, on Deer Ridge CA, forest management is designed to improve habitat for the endangered Indiana bat. In the Ozarks, on multiple conservation areas, forest management focuses on sustainable production of oaks that provide benefits for several wildlife species, including declining forest songbirds that require early successional forest and/or canopy gaps. In the deforested Mississippi River lowlands of southeast Missouri, multiple sites have been planted back into mixes of bottomland hardwood species and other floodplain forest trees to restore Missouri's highly imperiled bottomland forest habitat.



Red-breasted grosbeak



Above and right: Restored woodlands exhibit an incredible diversity of native grasses and wildflowers in the understory, offering a variety of food and cover benefiting wildlife.

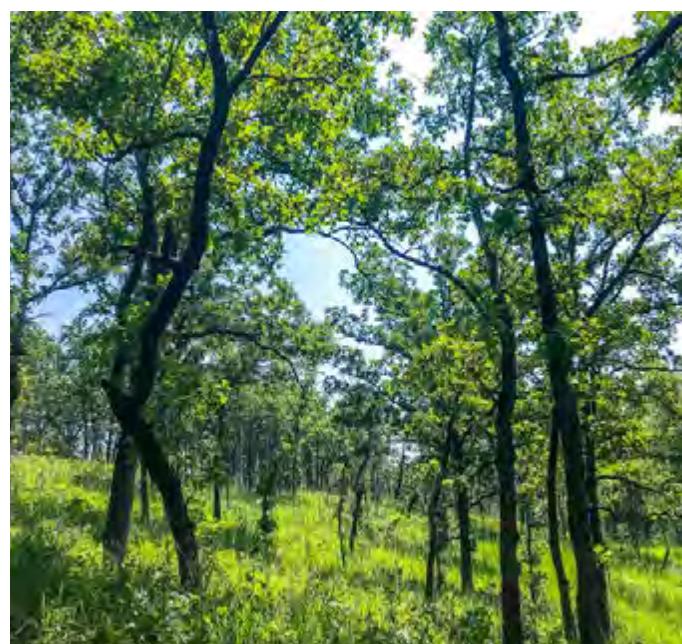
Woodlands

by Mike Leahy

Across Missouri, but especially in the Ozarks on dry ridges and south- and west-facing slopes dominated by mixtures of oaks (especially post oak), hickories, and sometimes shortleaf pine, occur woodland natural communities. A mixture of droughty soils and periodic wildland fires created scenes such as this described by H.R. Schoolcraft in 1819 in the upper Meramec River region: "... a succession of hills of moderate elevation, covered chiefly by oaks and without underbrush. A tall, thick, and rank growth of wild grass covers the whole country, in which the oaks are standing interspersed ..."

Woodlands are fire-adapted communities that often occur in association with glades (described on Page 14). In the absence of periodic fires, woodland sites, like glades and prairies, stagnate and become overtaken by undesirable woody plant growth that shades out the herbaceous plants. In contrast, restored woodlands are characterized by a variety of native grasses and especially blooming wildflowers in the understory. These wildflowers — mainly asters, sunflowers, and legumes — provide abundant nectar and pollen for butterflies and bees. Caterpillars, grasshoppers, and other insects feed on these herbaceous plants and in turn provide important food for migratory songbirds and turkey poult. Woodland restoration typically involves a combination of prescribed fire and tree thinning.

Some of MDC's earliest woodland restoration occurred in conjunction with glade restoration at Caney Mountain and Stegall Mountain natural areas in the Ozarks. Today the department is actively restoring woodlands statewide, including a large woodland and glade mosaic at Lead Mine CA leading to the expansion of the Niangua River Hills designated state natural area there.



Great spangled fritillary



Rivers and Streams

by Brian Todd and Sherry Fischer

Missouri's more than 110,000 miles of streams are the lifeblood of our landscapes. The water coursing through our streams reflects our past decisions and foreshadows our future. Stream systems don't have finite boundaries. The landscapes they flow through are called watersheds — all the land areas that contribute water, sediment, and nutrient runoff to the stream system. As such, everything we do on the landscape

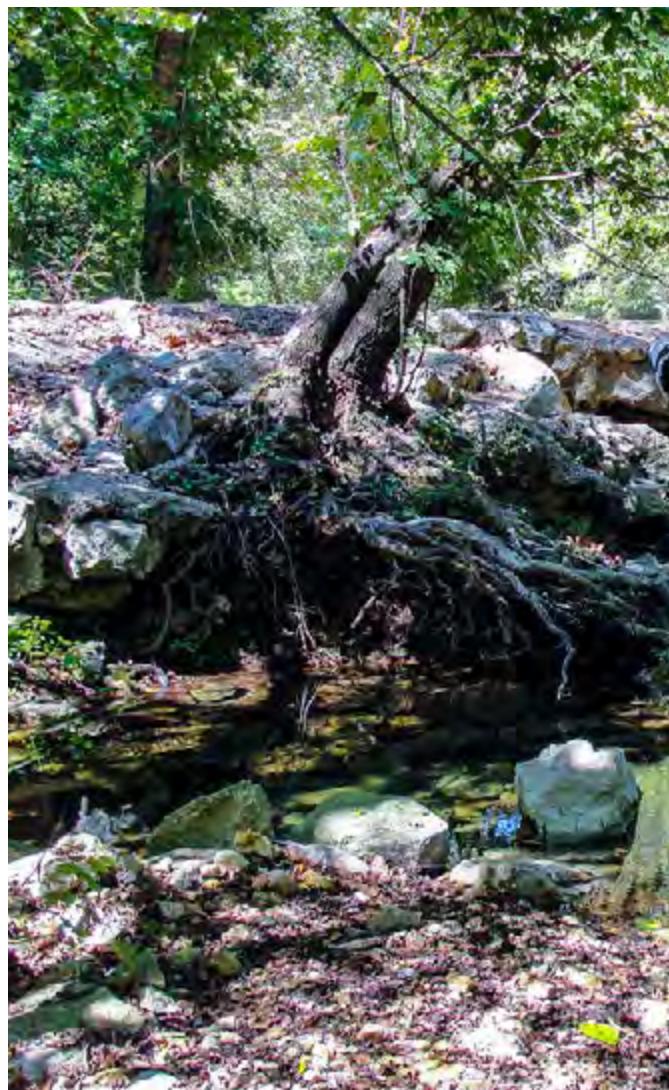
has an effect on stream life, water quality, and habitat. MDC works with landowners and many other partners to help ensure comprehensive and science-based stream and watershed management.

Stream restoration often involves incorporating best management practices throughout the watershed, which are actions that can reduce erosion and nutrient input, making stream systems healthier and more resilient. Streams that have areas of erosion, for example, may be suitable for stabilization practices like planting native trees, shrubs, grasses, and wildflowers.

Because streams are linear and connect all components of the landscape, the system must be investigated to determine what types of management and restoration practices are appropriate and where to place them. Streams naturally move and change over time and that must also be taken into consideration when diagnosing the cause of the problem and prescribing restoration and watershed practices. Ideally, stream restoration methods allow for natural changes to continue to occur but at more acceptable rates.

Right: A low-profile bridge improves stream function and the movement of aquatic wildlife.

Below: Road crossings like this impede stream function and restrict the movement of aquatic wildlife.





Wetlands

by Frank Nelson and Arianne Messerman

Wetlands are transition zones between land and water-based environments. Historically, natural wetlands dominated the floodplains and river deltas in Missouri. Over the past 150 years, many were converted to agricultural and commercial land. Wetlands provide incredible services, including acting as sponges to reduce flood severity and filter pollutants, carbon sequestration, recreational opportunities, and hosting a tremendous diversity of native plants and animals. As such, much like our native prairies and savannas, it is important to preserve our few remaining natural wetlands and restore and reconstruct degraded wetlands wherever possible.

Wetlands include seasonal, emergent marsh, shrub-scrub, forested swamp, fens, and seeps. It may be surprising that wetlands benefit from occasional drying. In fact, the 2022 drought will have ripple effects leading to positive changes. One ripple started when mud flats were exposed, stimulating the germination of annual plants like millet and smartweed. Wetland management often simulates this process by seasonally drawing water down to foster seed production. As natural dry conditions extended through the fall, only songbirds could access this wild grain and the bug-filled grasses and forbs. Additionally, many seeds were “stored” in the absence of autumn floods. When spring rains inundate these stores, a bounty of seeds and bugs will be available to fuel a broad diversity of birds as they migrate north.

Top: Healthy wetlands offer immense benefits to wildlife and people.

Inset: Wetland managers take advantage of dry conditions to improve wetland habitat and function.

Still other ripples began when wetland communities were “reset” through drying, supporting greater biodiversity through time. For example, the temporary elimination of aquatic predators, like fish, when wetlands dry can allow different animals, like amphibians, to flourish when wetlands refill. Dry conditions and a hard freeze can also knock back invasive plants by damaging the roots of hardy floating-leaved species, like American lotus. Further, droughts provide opportunities for MDC’s wetland managers to help with these resets. The 2022 drought enabled managers at Otter Slough CA to drain Otter Lake for the first time in 20 years. Once the soppy wetland soils hardened, contractors were able to enter the wetland with heavy machinery and mulch many of the willows that had begun choking the basin. Aquatic life will return and have more room to thrive when the drought subsides and the lake refills. MDC managers at other wetlands were similarly able to conduct large-scale vegetation management and make progress on construction projects. As water returns to Missouri’s wetlands, we look forward to watching the beautiful ripples of last year’s drought unfurl.

Caves

by Rhonda Rimer and Shelly Colatskie

Of Missouri's natural communities, caves seem the most alien, hosting just as alien-looking creatures, some found nowhere else on earth. At present, over 7,500 caves are known in Missouri.

Like a snowflake, each cave is unique. Caves vary in their geologic composition, size, diversity of creatures, difficulty to explore, variety of cave formations, and diversity of cave life. Some caves are completely barren of formations, others are extravagantly adorned. Missouri's caves host over 1,100 known species, including the federally endangered gray bat. Guano from gray and other bat species provides nutrients that benefit other cave life,

like grotto salamanders, cave adapted springtails, rove beetles, cave adapted millipedes, and pseudoscorpions.

With some Missouri cave species under threat, protecting caves and cave life is more important than ever. MDC, the Cave Research Foundation, Missouri Caves and Karst Conservancy, Missouri Speleological Survey, grotto groups, and other caving organizations have long worked to survey, map, and protect caves and the species that live within or utilize them. This has included restorations to remove graffiti and trash from caves that have been vandalized. In addition, MDC and other partners have helped private landowners install cave gates. While it isn't necessary to gate every cave, some caves benefit from a gate to protect sensitive species and habitat and for human safety. The most

recent gating project in Missouri, on private land in the Little Niangua River watershed, drew volunteers from across the state who love caves and wanted to be a part of protecting them.

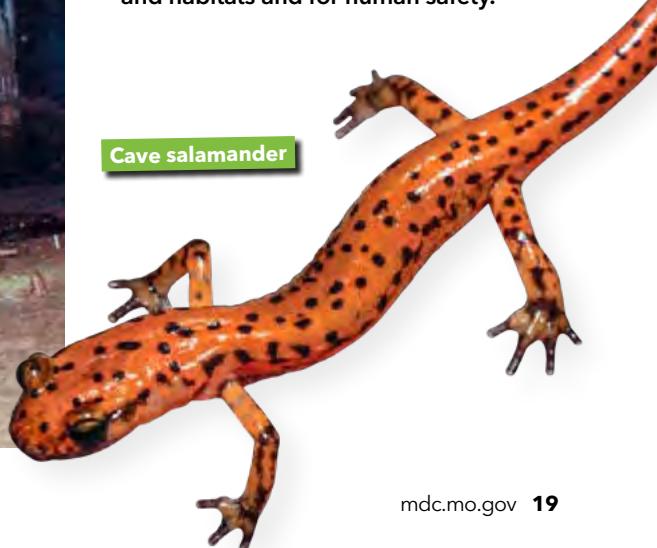
Caves should only be accessed through landowner permission and always remember the caver's motto: "Take nothing but pictures, leave nothing but footprints, kill nothing but time." ▲

A diverse team of MDC staff from across the state shared their expertise and passion for Missouri's natural communities toward authoring this article. Nate Muenks served as coordinator to pull the team members together, and he and Mike Leahy served as the primary content editors.



Left: Many caves offer a variety of formations, such as columns, soda straws, stalactites, and stalagmites. **Above:** Cave gating is sometimes necessary to protect sensitive species and habitats and for human safety.

Cave salamander



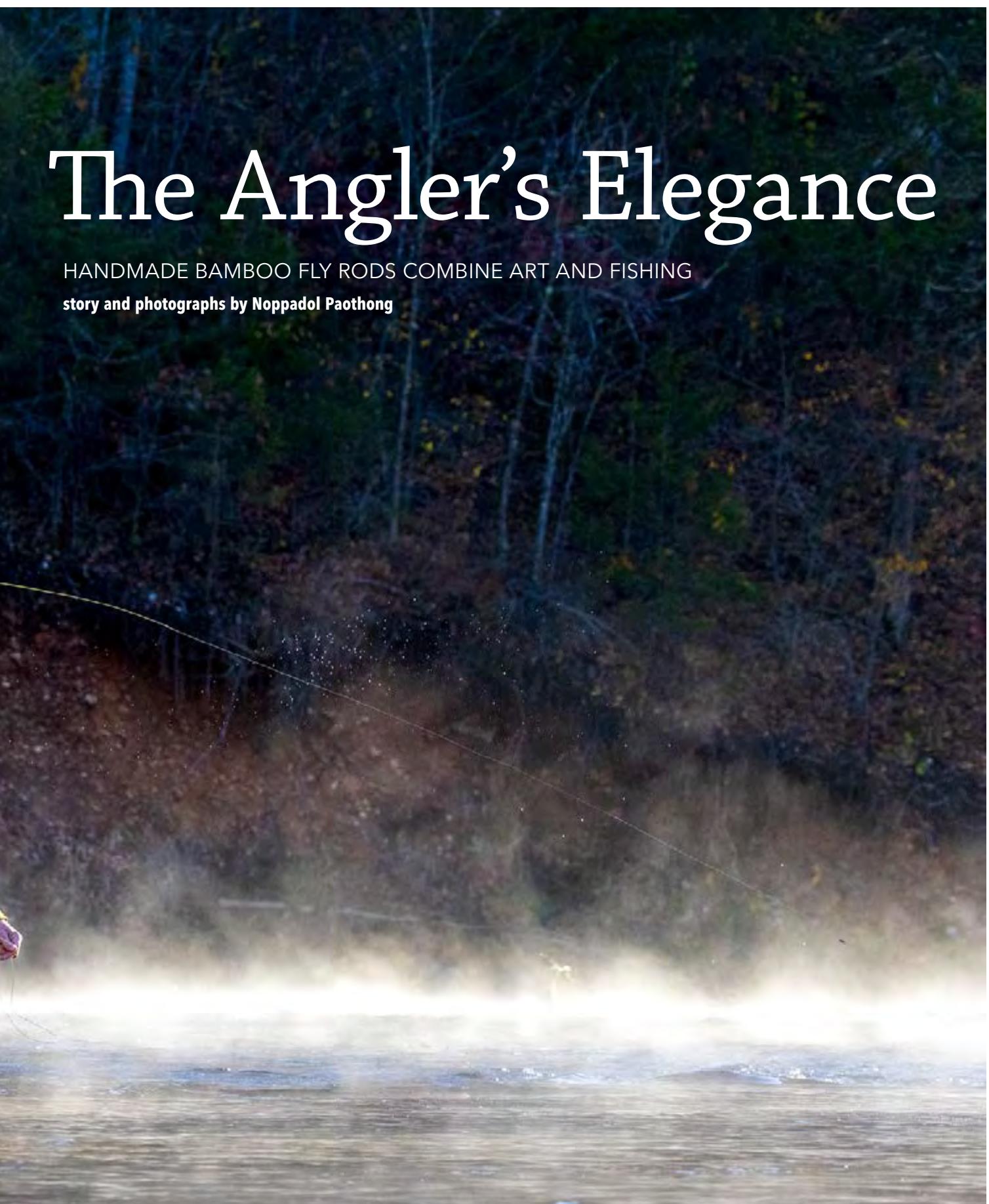


The beauty of fishing with a bamboo rod is something that no artificial material can duplicate. Fly-fishing, particularly for trout, often occurs in beautiful places, in harmony with the environment.

The Angler's Elegance

HANDMADE BAMBOO FLY RODS COMBINE ART AND FISHING

story and photographs by Noppadol Paothong





I was introduced to a bamboo rod as a young boy who loved fishing in the countryside of Thailand but couldn't afford a modern rod-fitting with a reel. My set-up was simple — a fishing line tied to the end of a piece of bamboo. It did the trick of catching fish and allowed me to develop a deep connection with the outdoors.

When I heard of a fly rod made of bamboo, it brought back my fondest memories of childhood. However, this rod is not the simple bamboo pole that I once used. Rather, it is a high-quality bamboo rod that has been painstakingly processed by splitting the bamboo, stripping it into 70 or more pieces, and sanding and varnishing, which can take months before it is crafted into an elegant fly rod that resembles a piece of art. Creating one of these fine rods is a process that requires skilled craftsmanship with a degree of passion and persistence.

But this type of rod is not new. Perfecting the "split cane" method in the United States can be traced back over 150 years.

Origin of the Cane

Historically, manufacturers of fly rods searched for lighter and stiffer materials of smaller diameter. Rod makers found the best combination of lightness and strength in bamboo.

Before split cane, most rods were made of woods, which were exceedingly heavy, easy to break at the tip, and not practical for a fly-fishing rod. In the U.S., the first rod made by splitting bamboo and gluing it together into a hexagonal six-strip design that is still used today was developed in the late 18th century.

Most people may be surprised to learn that bamboo is actually part of the giant grass family. The majority of the 1,450 species of true bamboo, which are collectively known as cane, are found throughout the world but originated in southern and southeastern Asia. The U.S. is home to three very distinct native species of *Arundinaria* — *A. appalachiana*, *A. gigantea*, and *A. tecta* — and all of these are native to the southeast.



Although the strength of bamboo lies in the fibers concentrated toward the periphery of the culm (stalk), not all bamboos are created equally. Bamboo is a natural material, and with that comes inherent variations in density, flexibility, and durability. In fact, the bamboo's quality plays a prominent role in a rod's performance.

Fibrovascular bundles or "power fibers" give bamboo its stiffness and strength. Rod makers look for culms with a dense layer of fibers, characteristic of the best specimens found only in Tonkin bamboo, which has the highest amount of fibrovascular bundles. These bundles are concentrated toward the outer surface of the hollow bamboo culm.

Tonkin bamboo (*Arundinaria amabilis McClure*) is named after American botanist Floyd Alonzo McClure, who scientifically described the plant he studied in China and recognized in 1925.

Tonkin bamboo was first imported to the U.S. in 1897. Prior to Tonkin, Calcutta bamboos from India were widely used to make fly rods; however, after World War I, Tonkin bamboo fly rods replaced them. This so-called "Tonkin cane" was much stiffer and stronger than Calcutta and produced a steelier fly rod.

Left: The process of making a bamboo fishing rod begins by splitting ¼-inch strips from the rind of a bamboo pole.

Top: Nodes are removed and the strips are reconstructed.

Bottom: Strips are then milled into triangles.



Top: Triangular strips are planed on a hand mill.

Bottom: Six tapered strips are glued together.





Top: The six strips fit together to form a hexagon.

Bottom: The rod is then carefully checked for straightness.

When combined to form a hexagon, the concentration of fibrovascular bundles in Tonkin bamboo give the rod stiffness and strength.

Left: After the strips are glued together, they are bound with string.
Right: Guides are carefully wrapped with silk thread with the aid of a magnifier.





The ultimate reward for constructing a bamboo fishing rod – a rainbow trout caught on Little Piney Creek.

Making the Split Cane

To craft a bamboo rod, culm is split, heat-treated, planed to taper into smaller strips, and glued to up to a 65-thousandths-of-an-inch tip, wrapped in silk, varnished a honey-colored finish, and equipped with a grip. Even with highly skilled rod makers, it can take anywhere from three to six months to design one fly rod.

Even though bamboo is technically a grass, it looks and works like wood, so woodworking skills translate. But the main skill you need is the ability to use tools — hand tools.

Working with tools, fixing things, and woodworking are things Bill Lamberson, professor emeritus of animal sciences at the University of Missouri, has been doing for most of his life. He found that creating his fly rods required taking some combination of patience, skill, and discipline to another level. It took him 18 years to successfully construct his first bamboo rod in 1998, a rod he has to this day.

His interests in the art of crafting bamboo rods began when he purchased old bamboo rods at garage sales and refurbished them, but it later became logical for him to try to craft his own rod. He was mentored by Tom Morgan, who owned Winston Rod company, and later produced equipment to plane bamboo rods. But the core motivation is the ability to design and construct a rod that fits his personal style of fishing.

"Bamboo has a different feel than graphite, and it encourages fishing at a more leisurely pace," said Lamberson.

Since his retirement in 2021, Lamberson has crafted at least one rod a month and has built over 300 bamboo rods over the years and donated them to conservation charities for fundraising, including Mid-Missouri Trout Unlimited. He is well regarded in the rod-making community, which appreciates his craftsmanship.

While many of today's fine fishing rods are made of composite graphite, fishing with a bamboo rod is something that no artificial material can duplicate for its beauty and delicacy. And crafting a natural material that was once alive into a beautiful piece of art is a testament of combining human grace with nature. According to Lamberson, fly-fishing, and in particular trout fishing, seems to happen in beautiful places and is in harmony with the environment.

"I have caught a lot of trout in my lifetime, and my fishing is now more about the experience than about catching fish," he said.

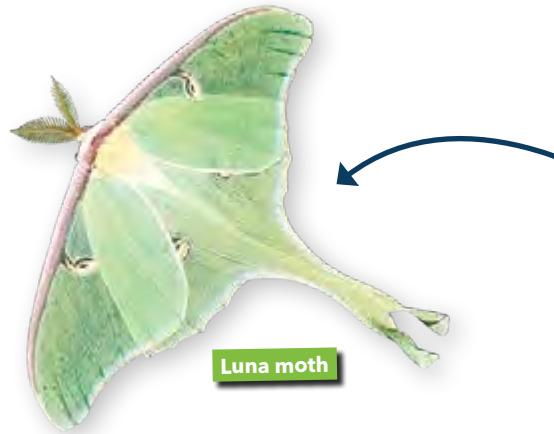
And fishing with a bamboo fly rod that he has personally crafted and flies that he has tied seem to mesh well together. ▲

Noppadol Paothong has worked as a staff photographer with the Missouri Department of Conservation since 2006, focusing on rare and endangered species. He also is an Associate Fellow with the International League of Conservation Photographers (iLCP). He hopes his images will help people connect with nature and the conservation issues for which he deeply cares.

Get Outside

in MAY

→ Ways to connect
with nature



Hooray for Bees

May 20 is World Bee Day. This annual celebration calls attention to the essential role bees and other pollinators play in keeping people and the planet healthy, and the many challenges they face today.

Bees, among the hardest working creatures on the planet, benefit people, plants, and the environment. By carrying pollen from one flower to another, bees enable not only the production of an abundance of fruits, nuts, and seeds, but also more variety and better quality, contributing to food security and nutrition.

Pollinators, such as bees, birds, and bats, affect 35 percent of the world's crop production, increasing outputs of 87 of the leading food crops worldwide, plus many plant-derived medicines. Three out of four crops across the globe that produce fruits or seeds for human use depend, at least in part, on pollinators. For information about the varieties of bees in Missouri, and the plants they prefer, visit the online *Field Guide* at short.mdc.mo.gov/4gM.



Common eastern bumblebee

American bumblebee



Carpenter bee



Natural Events to See This Month

Here's what's going on in the natural world.



Eastern
hog-nosed
snakes
mate.



Blue-eyed
Mary
blooms.



Coyotes
howl.

Night Butterflies

Mid-19th-century naturalists referred to moths as "night butterflies" because they are attracted to lights at night. Look for them resting on your house in early morning. For help identifying your nighttime visitors, visit our online *Field Guide* at short.mdc.mo.gov/4gQ.



Enjoy National Fishing and Boating Week

With more than 110,000 miles of running water, Missouri is the perfect place to celebrate National Fishing and Boating Week, June 3-11. When it comes to fishing, Missouri has a lot to offer. More than 200 species of fish live in the Show-Me State, and more than four dozen species offer opportunities for anglers. Seasons are long, and daily limits are generous. Free Fishing Days, June 10 and 11, will also coincide with this week. So, ready the fishing gear and rev-up your boat's engines. The water is fine, and the fish are biting. Need help finding a place to go? Check out the MO Outdoors app, available in Android or iPhone platforms, at mdc.mo.gov/mooutdoors.



Common
nighthawks
arrive.



Crappie
spawn.

DISCOVER FISHING

Want to make connections?
Why not **discover fishing**?
It's a great way for everyone
to have fun outdoors and
learn about conservation.

With fishing you can:

 Find adventure
and excitement

 Spend quality
time with family

 Escape the stress
of everyday life

 Reconnect
with friends

 Make lifetime
memories



Download the
MO Fishing app
today to make
it even easier!

Available on the
App Store  Download for
Android 

Places to Go

KANSAS CITY REGION

Ralph and Martha Perry Memorial Conservation Area

From humble beginnings

by Larry Archer

Like a monarch butterfly, which begins life as a near microscopic egg on a stalk of milkweed, the Ralph and Martha Perry Memorial Conservation Area (CA) has its own modest origin story.

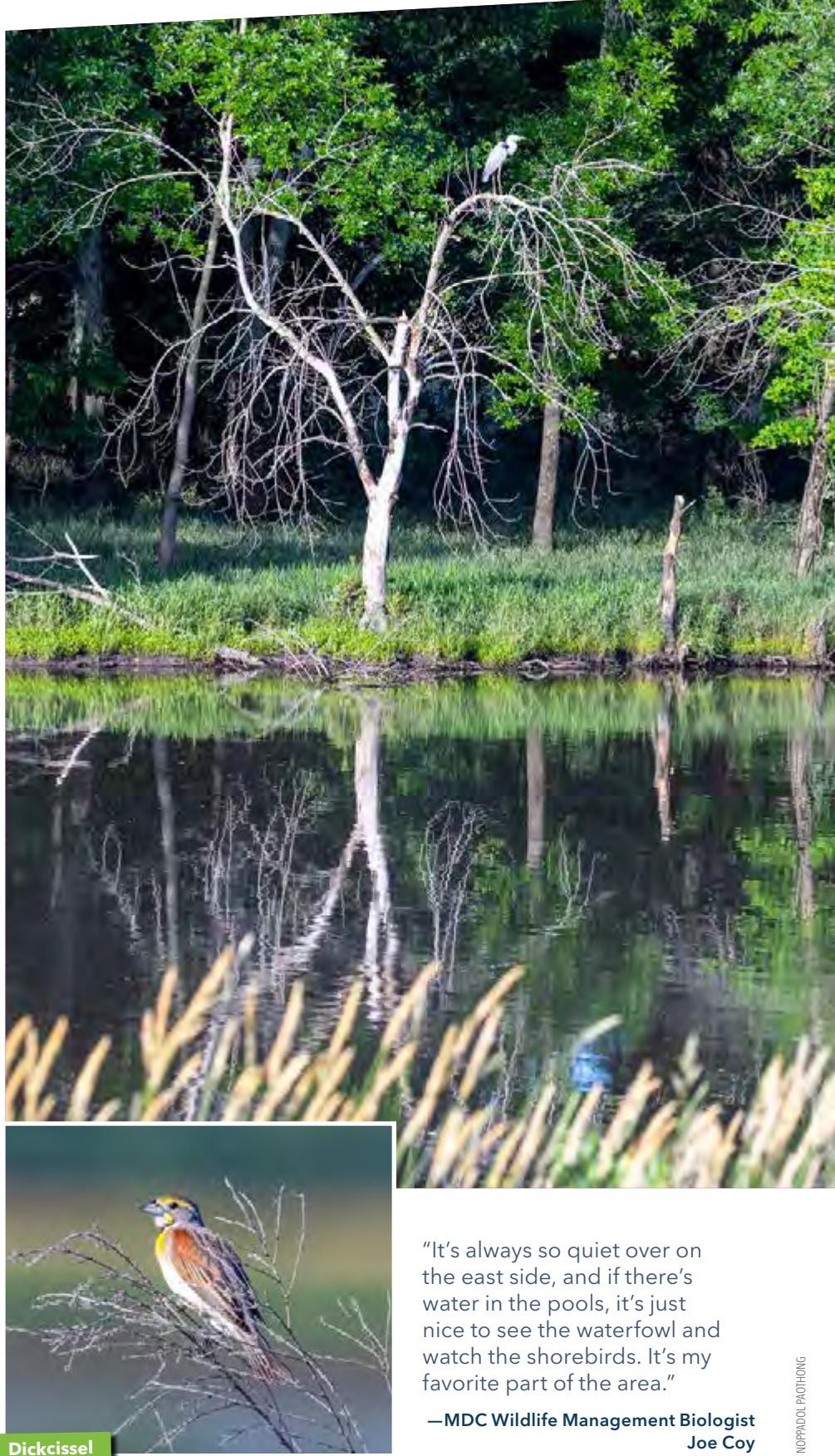
Now consisting of more than 4,100 acres in Johnson, Pettis, and Saline counties, Perry CA began as a 40-acre contribution from the Perrys, with additional funding to grow the area when additional land became available, said MDC Wildlife Management Biologist Joe Coy.

"It didn't happen all at once, but it happened fairly quickly because it was large tracts that was coming up for sale," Coy said.

At more than 100 times its original size, the area now offers a variety of habitats, including wetlands and two lakes, a shooting range, service roads for hiking, and several areas open to camping.

With approximately 900 acres of managed wetlands, fed primarily by overflow from the Blackwater River, the area attracts migrating waterfowl, shorebirds, and the people who like to watch them, he said.

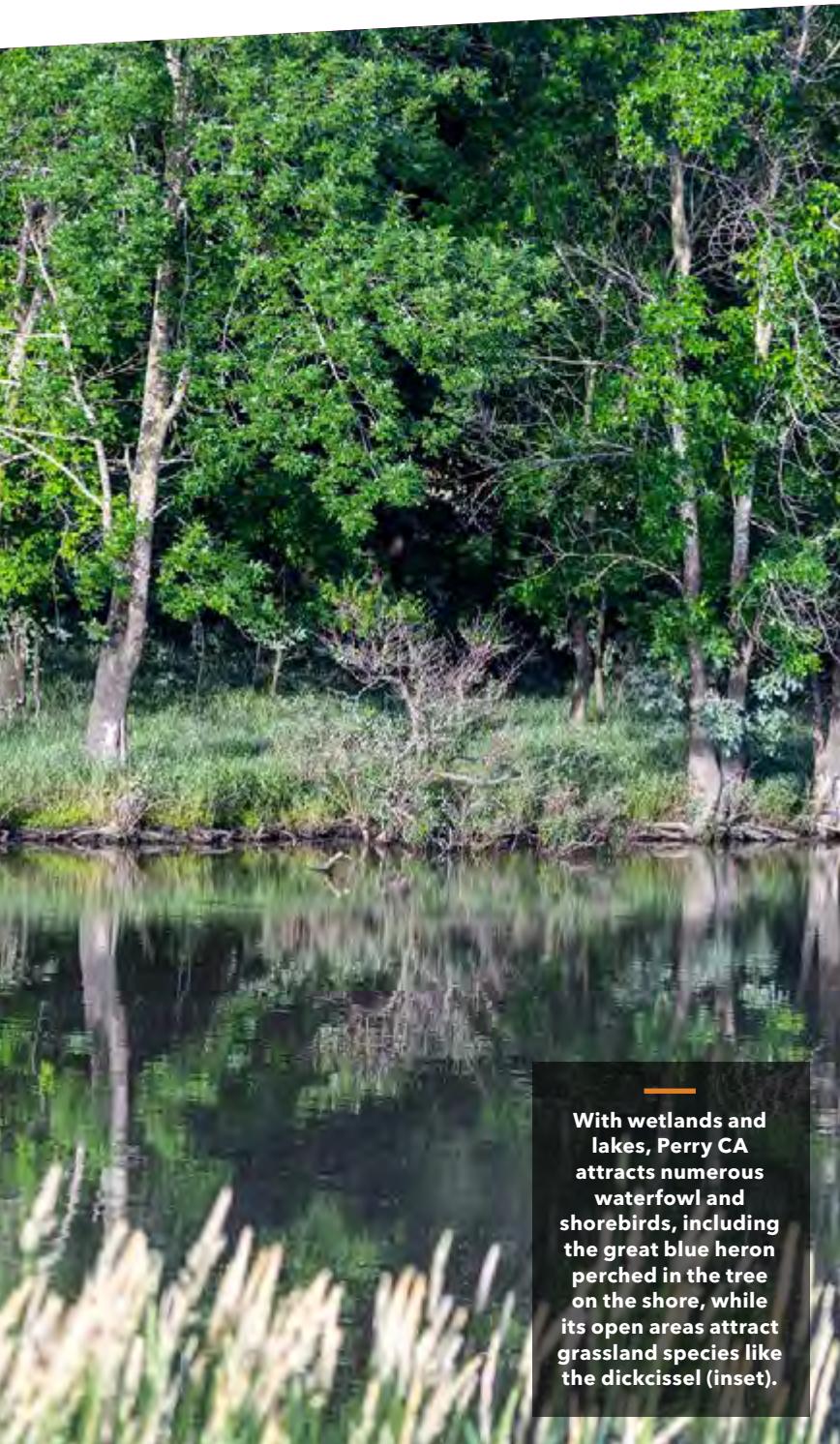
"It's a premier spot for migrating waterfowl in general, because during that time frame of May, you'll still be catching quite a few later migrating birds, like blue-winged teal and northern shovelers," he said.



Dickcissel

"It's always so quiet over on the east side, and if there's water in the pools, it's just nice to see the waterfowl and watch the shorebirds. It's my favorite part of the area."

—MDC Wildlife Management Biologist
Joe Coy



With wetlands and lakes, Perry CA attracts numerous waterfowl and shorebirds, including the great blue heron perched in the tree on the shore, while its open areas attract grassland species like the dickcissel (inset).

WHAT TO LOOK FOR WHEN YOU VISIT



Northern shoveler



Gadwall



RALPH AND MARTHA PERRY MEMORIAL CONSERVATION AREA

consists of 4,134.4 acres in Johnson, Pettis, and Saline counties. West tract: from Concordia, take Highway 23 south 5 miles. East tract north of Blackwater River: from Concordia, take Highway 23 south approximately 4 miles, then east on NE 1200, area begins where NE 1200 turns north. East tracts south of Blackwater River: from Sweet Springs, take Highway 127 south, then Route NN west, and north on Blackwater Road, or west on Dunksburg Road.

38.9087, -93.5697

short.mdc.mo.gov/4gK 660-530-5500

WHAT TO DO WHEN YOU VISIT

 **Biking** Includes 9.8 miles of improved, unimproved, and service roads open to biking year-round.

 **Birdwatching** The eBird list of birds recorded at Perry CA is available at short.mdc.mo.gov/4gL.

 **Camping** Five individual campsites.

 **Fishing** Black bass, catfish, sunfish.

 **Hunting** Deer and **turkey**. Regulations are subject to annual changes. Refer to MDC's regulation page online at short.mdc.mo.gov/Zjw.

Also **dove**, **quail**, **rabbit**, and **squirrel**

 **Shooting Range** Unstaffed shooting range with 25-, 50-, and 100-yard target holders. Closed on Wednesdays for maintenance.

 **Trapping** Special use permit required.

 **Waterfowl Hunting** Open hunting.

Wild Guide



Wild Hyacinth

Camassia esculenta

Status

Lily family (Liliaceae) or asparagus family (Asparagaceae)

Size

Height: to 2 feet

Distribution

Scattered statewide except northwest and southeast Missouri



Wild hyacinth flowers from April through May with six tepals (three petals and three petal-like sepals) that are white to bluish white or lavender. There are as many as 50 fragrant blooms on a long single stalk that can grow to 2 feet tall. Its basal leaves are narrow and less than $\frac{1}{2}$ inch wide and its rootstock is a bulb. Wild hyacinth occurs in prairies, rocky slopes, glades, bluff ledges, low, rich upland to bottomland forests, roadsides, and old fields.

Did You Know?

A related plant, quamash or small camas, was an important food for several Native American tribes and for members of the Lewis and Clark expedition. If you're thinking about trying these edible bulbs, make sure you can tell the difference between this plant and its poisonous relatives.



ECOSYSTEM CONNECTIONS

Wild hyacinth is an important food source for a variety of animals. Numerous insects, including bees, wasps, flies, and butterflies, are attracted to the nectar of these fragrant flowers. It is likely that mammals, including deer and other herbivores, eat the foliage.

Outdoor Calendar

MISSOURI DEPARTMENT OF CONSERVATION

FISHING

Black Bass

Impounded waters and non-Ozark streams:
Open all year

Most streams south of the Missouri River:

- ▶ Catch-and-Release:
March 1–May 26, 2023
- ▶ Catch-and-Keep:
May 27, 2023–Feb. 29, 2024

Bullfrogs, Green Frogs

June 30 at sunset–Oct. 31, 2023

Nongame Fish Gigging

Impounded Waters, sunrise to sunset:
Feb. 16–Sept. 14, 2023

Paddlefish

On the Mississippi River:
March 15–May 15, 2023
Sept. 15–Dec. 15, 2023

Trout Parks

State trout parks are open seven days a week
March 1 through Oct. 31.

Catch-and-Keep:
March 1–Oct. 31, 2023



For complete information about seasons, limits, methods, and restrictions, consult the *Wildlife Code of Missouri* at short.mdc.mo.gov/Zib. Current hunting, trapping, and fishing regulation booklets are available from local permit vendors or online at short.mdc.mo.gov/ZZf.

Buy Permits and Permit Card

Buy Missouri hunting and fishing permits from numerous vendors around the state, online at mdc.mo.gov/buypermits, or through our free mobile apps, MO Hunting and MO Fishing.



Permit cards are an additional way to show proof of most permits. Buy a new permit card for a one-time fee of \$2 at mdc.mo.gov/buypermits. Buyers can select from five images: bass, range, buck, bluebird, or mallard duck.



HUNTING

Black Bear*

Oct. 16–25, 2023

*Only hunters selected through a random drawing may participate in these hunting seasons.

Bullfrogs, Green Frogs

June 30 at sunset–Oct. 31, 2023

Coyote

Restrictions apply during April, spring turkey season, and firearms deer season.

Open all year

Crow

Nov. 1, 2023–March 3, 2024

Deer

Archery:

Sept. 15–Nov. 10, 2023
Nov. 22, 2023–Jan. 15, 2024

Firearms:

- ▶ **New!** Early Antlerless Portion (open areas only): Oct. 6–8, 2023
- ▶ Early Youth Portion (ages 6–15): Oct. 28–29, 2023
- ▶ November Portion: Nov. 11–21, 2023
- ▶ **New!** CWD Portion (open areas only): Nov. 22–26, 2023
- ▶ Late Youth Portion (ages 6–15): Nov. 24–26, 2023
- ▶ Late Antlerless Portion (open areas only): Dec. 2–10, 2023
- ▶ Alternative Methods Portion: Dec. 23, 2023–Jan. 2, 2024

Elk*

Archery:

Oct. 21–29, 2023

Firearms:

Dec. 9–17, 2023

Groundhog (Woodchuck)

May 8–Dec. 15, 2023

Pheasant

Youth (ages 6–15):

Oct. 28–29, 2023

Regular:

Nov. 1, 2023–Jan. 15, 2024

Quail

Youth (ages 6–15):

Oct. 28–29, 2023

Regular:

Nov. 1, 2023–Jan. 15, 2024

Rabbit

Oct. 1, 2023–Feb. 15, 2024

Squirrel

May 27, 2023–Feb. 15, 2024

Turkey

Archery:

Sept. 15–Nov. 10, 2023
Nov. 22, 2023–Jan. 15, 2024

Firearms:

- ▶ Spring: April 17–May 7, 2023
- ▶ Fall: Oct. 1–31, 2023

Waterfowl

See the Migratory Bird and Waterfowl Hunting Digest or visit short.mdc.mo.gov/ZZx for more information.



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on Instagram**

@moconservation

As the old saying goes, the early bird gets the worm. But, in the case of this summer tanager, the early bird gets the bug. What will you get when you discover nature today? The possibilities are endless.

 by **Noppadol Paothong**

Free to Missouri households

To subscribe, cancel your subscription, or update your address, visit mdc.mo.gov/conmag.